PRIOR ART

Fig 1

PRIOR ART
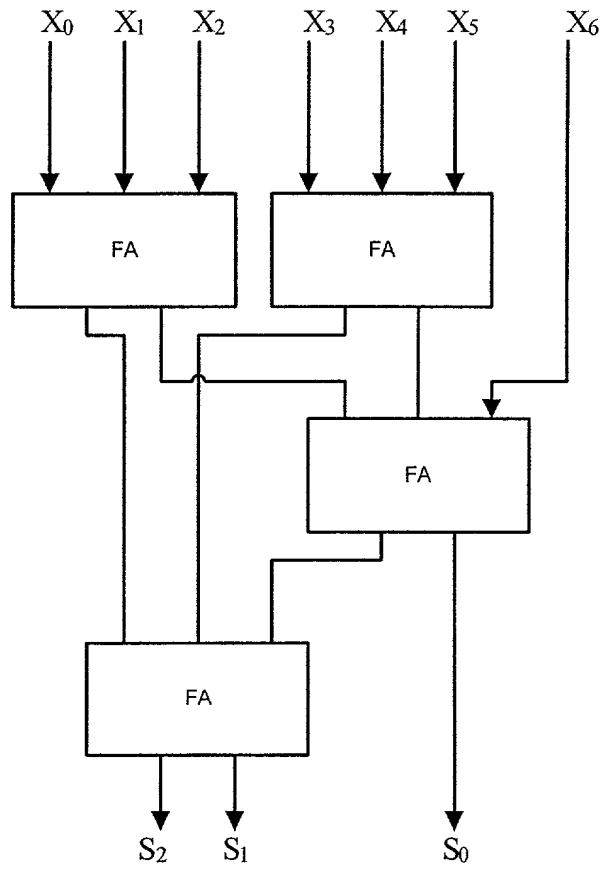

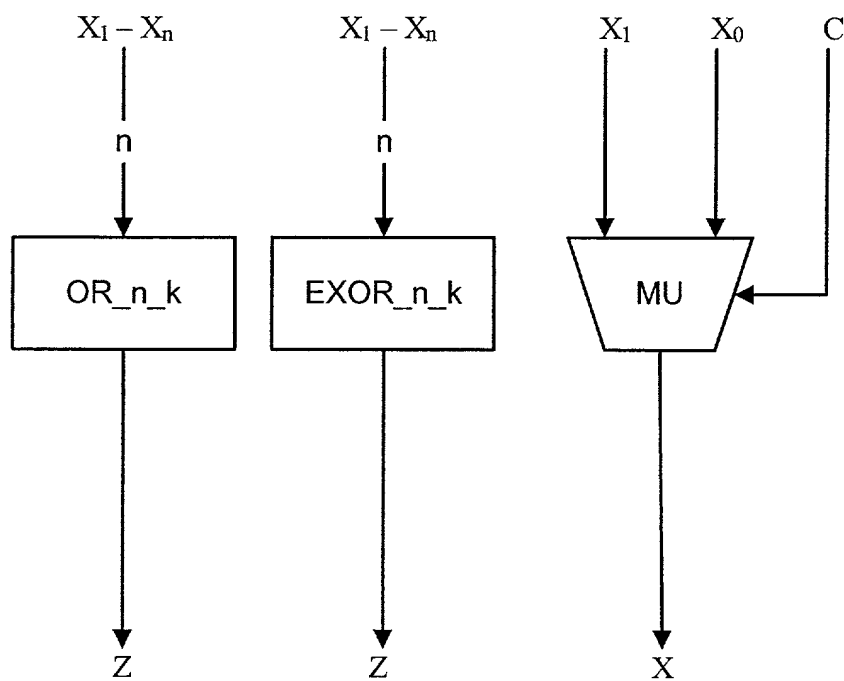
Fig 2

$X_1 - X_n$ $X_1 - X_n$ X_1 X_0 C
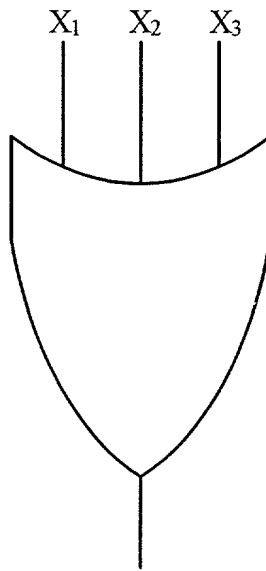
n   n

| OR_n_k | EXOR_n_k | MU |

Z   Z   X

Fig 3

OR_3_1

X₁ X₂ X₃

Fig 4

OR_4_1
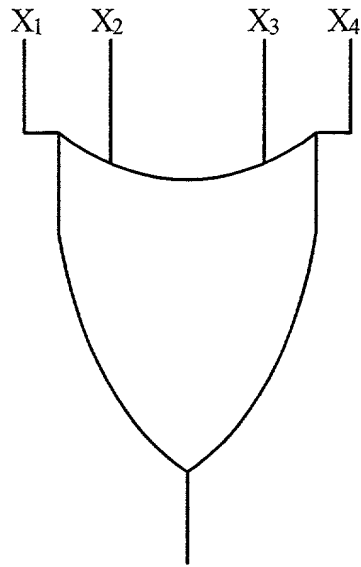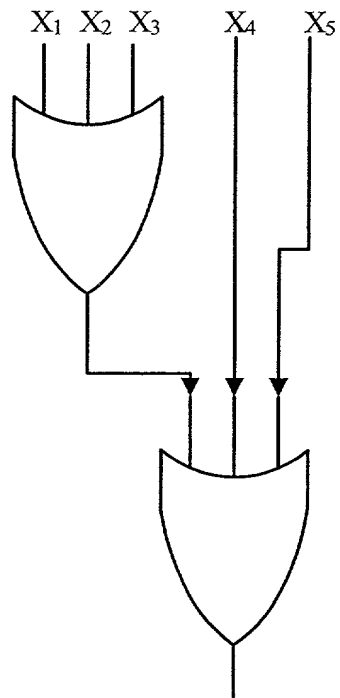

Fig 5

OR_5_1

Fig 6

EXOR_7_1

Fig 7

Fig 8

Fig 9

Fig 10

$X_1 - X_5$ X_6 X_7

5   5

OR_5_2   OR_5_1

Fig 11

Fig 12

$X_1 - X_4$

$X_5 - X_7$

OR_4_3

OR_4_4

OR_4_2

OR_4_1

EXOR_7_1

OR_3_1

OR_3_2

OR_3_3

MU

S_2

S_1

S_0
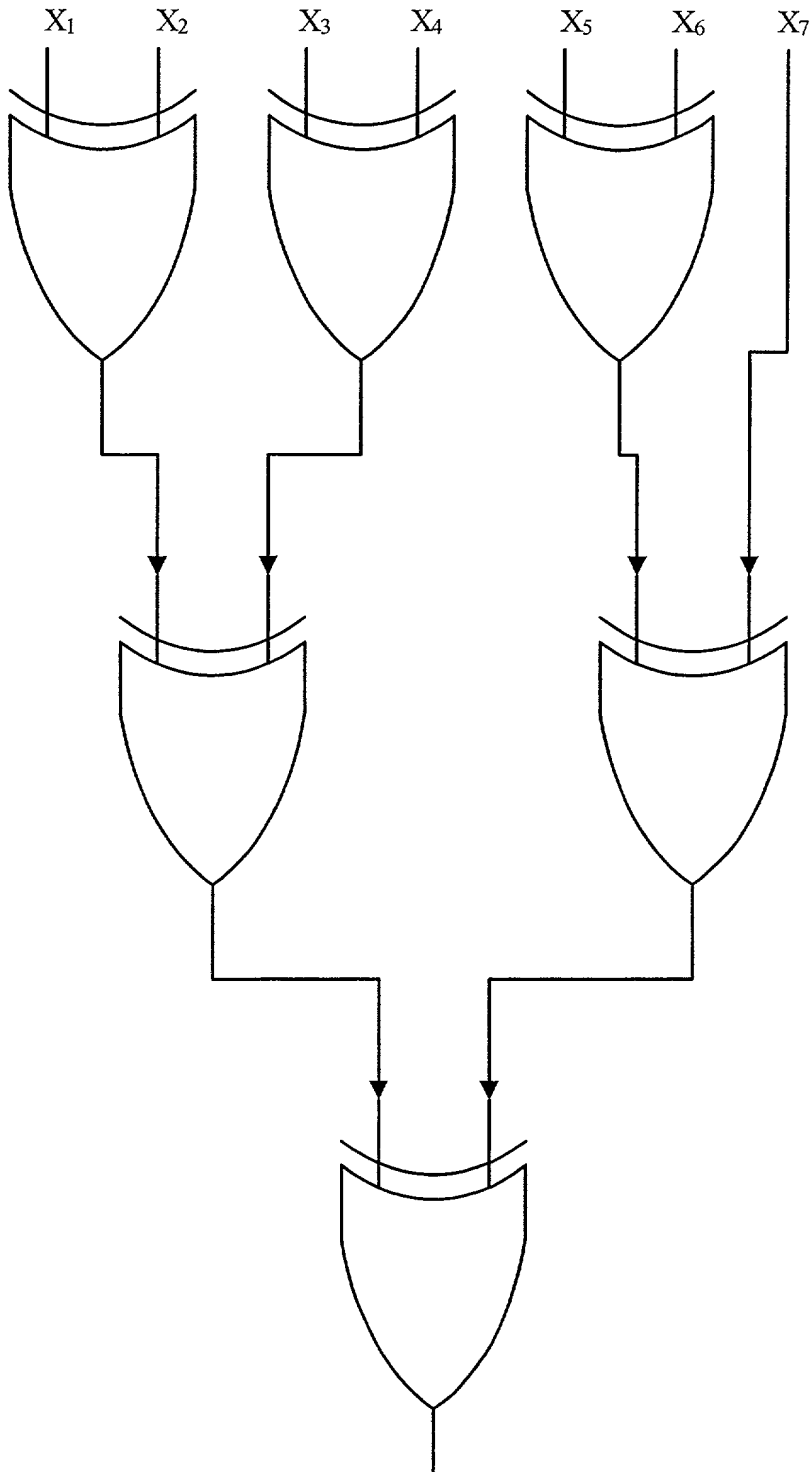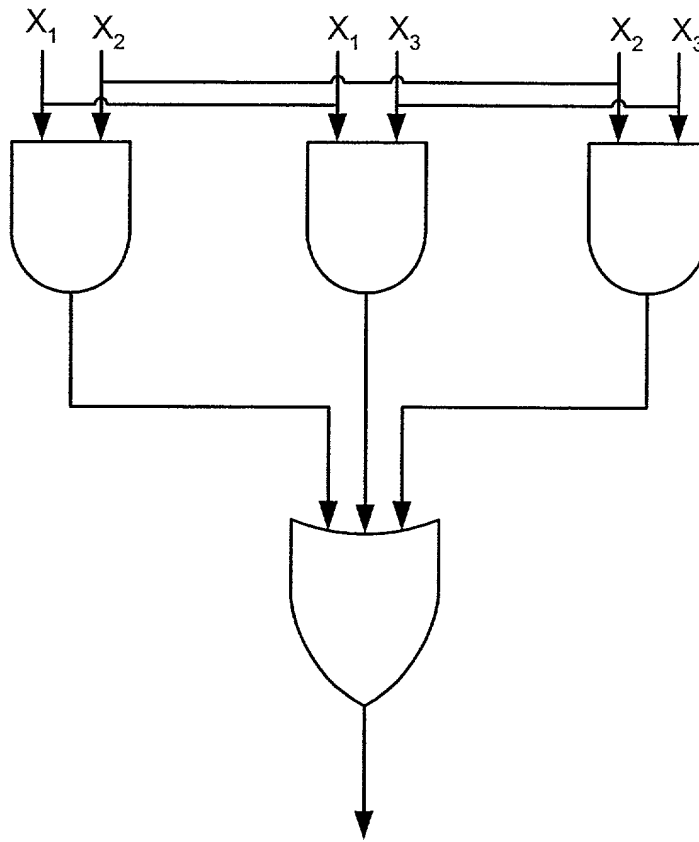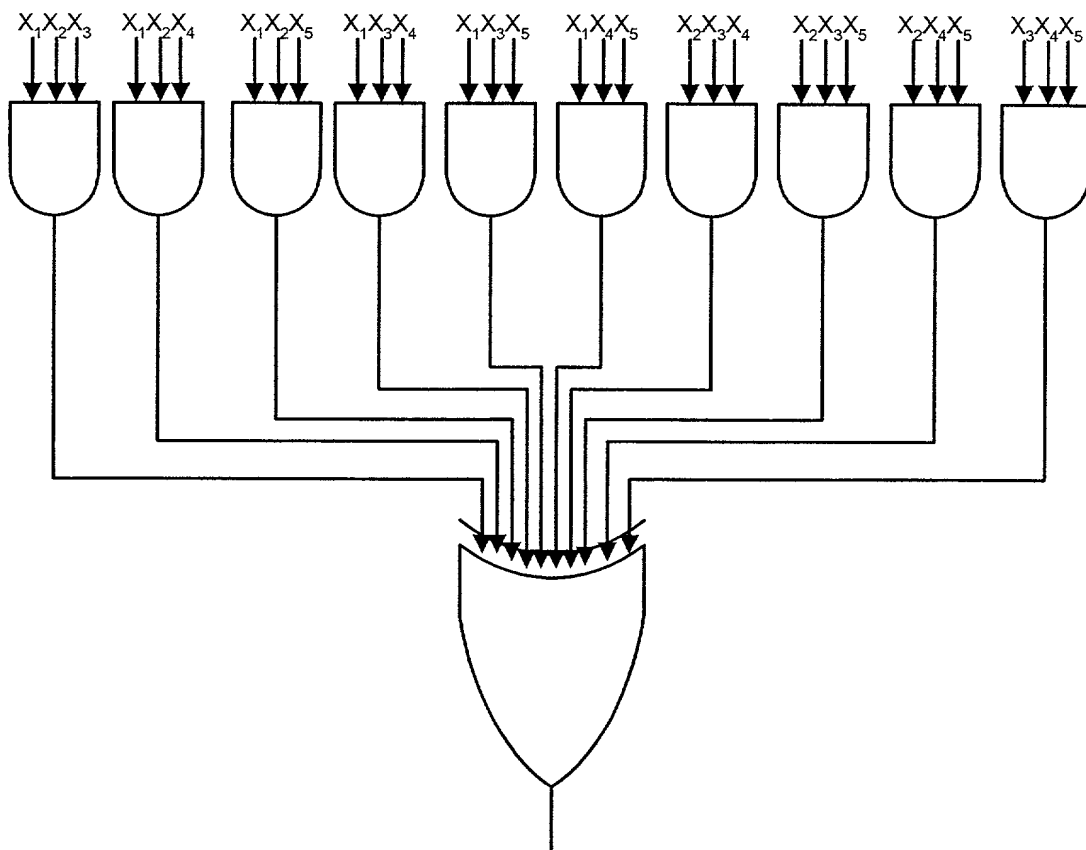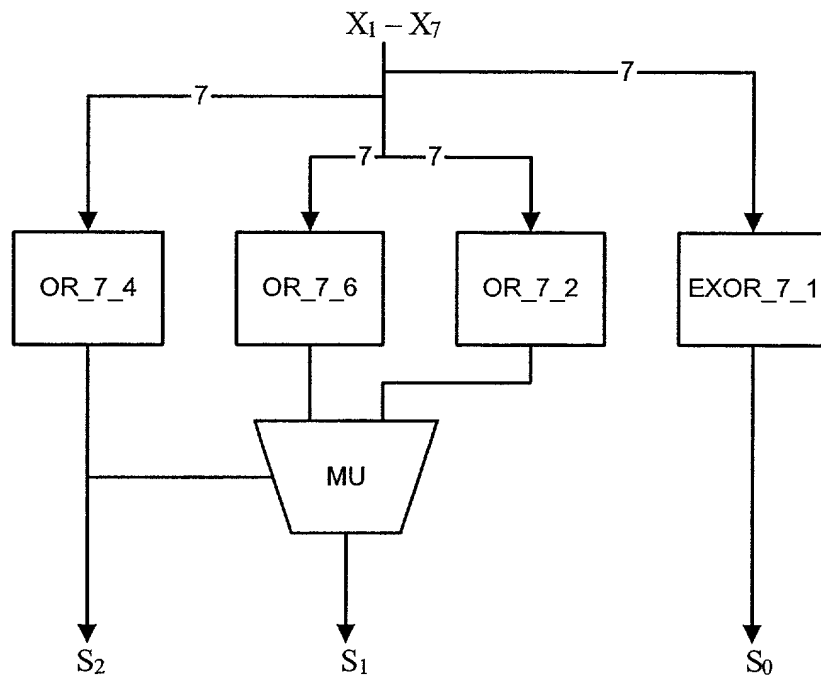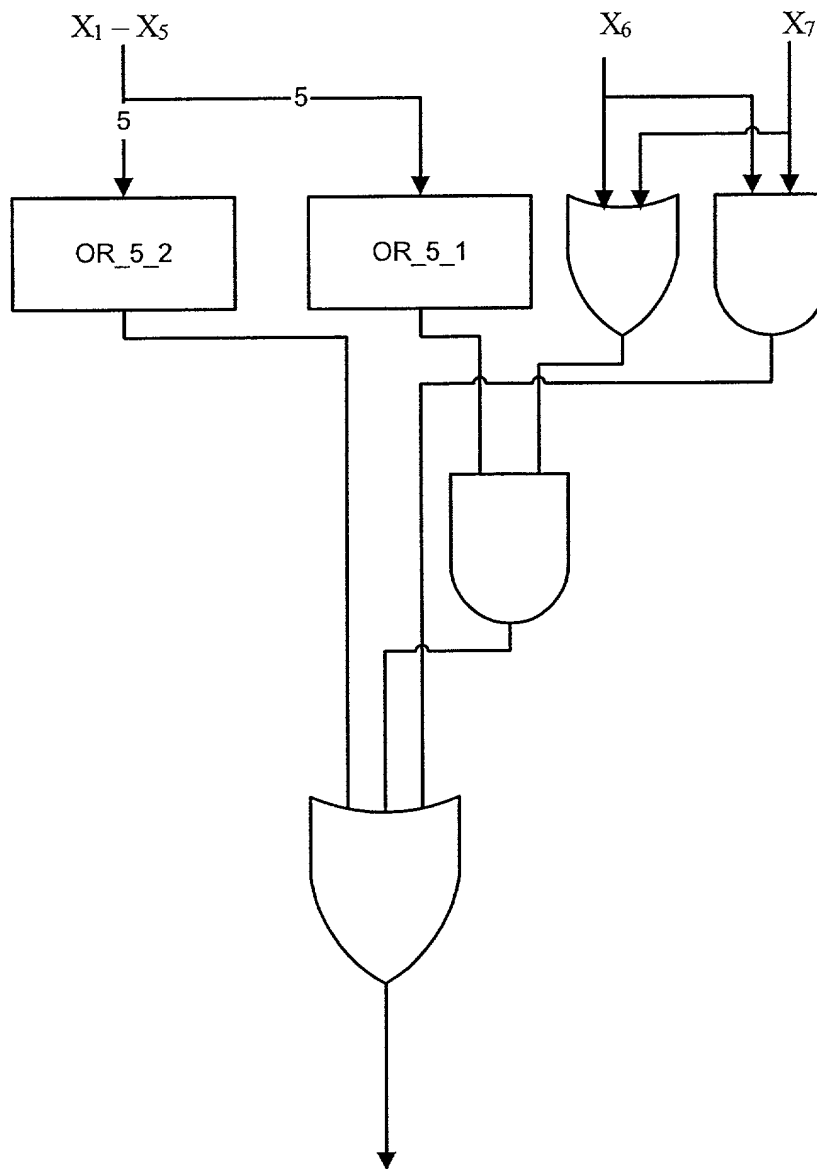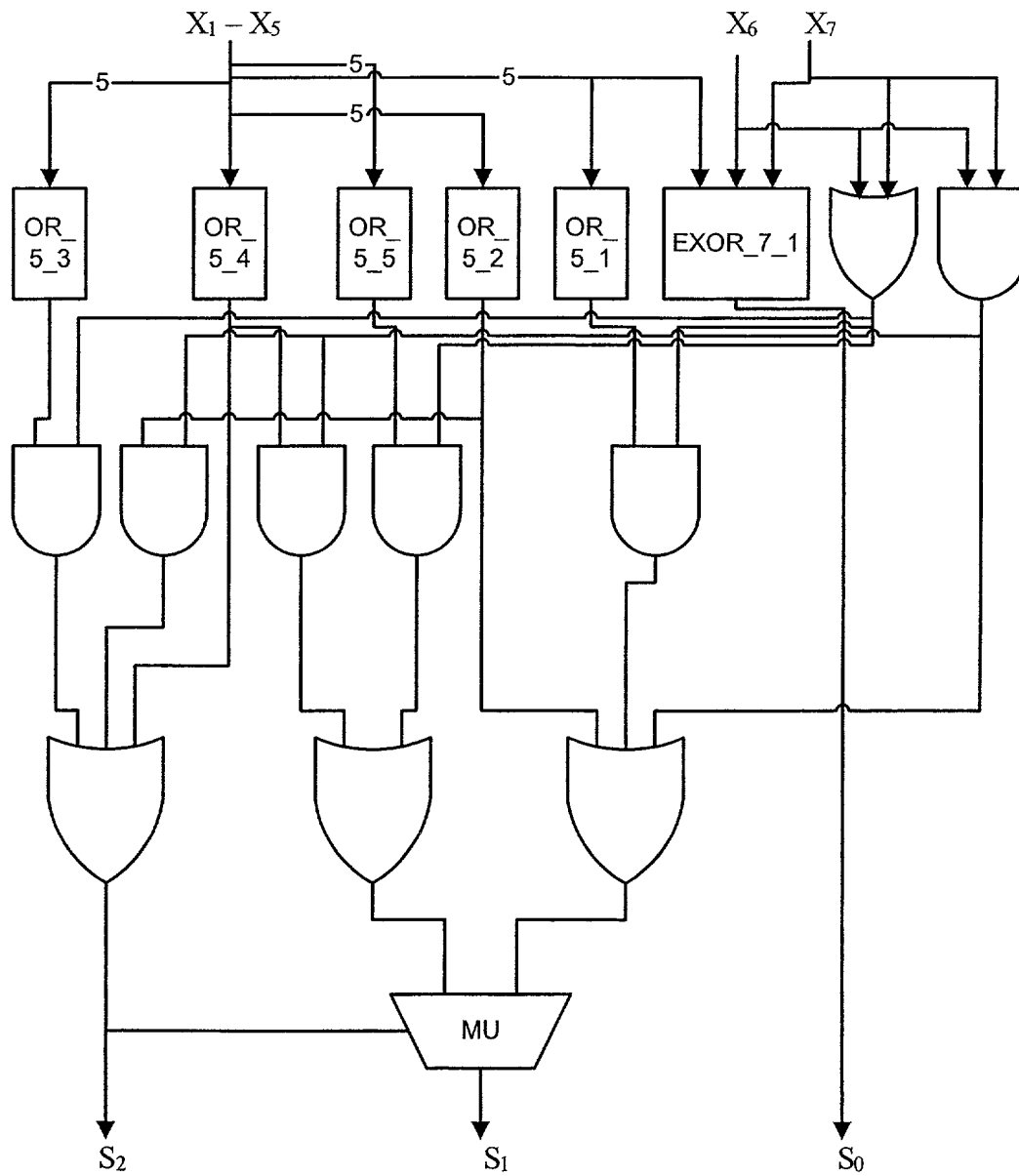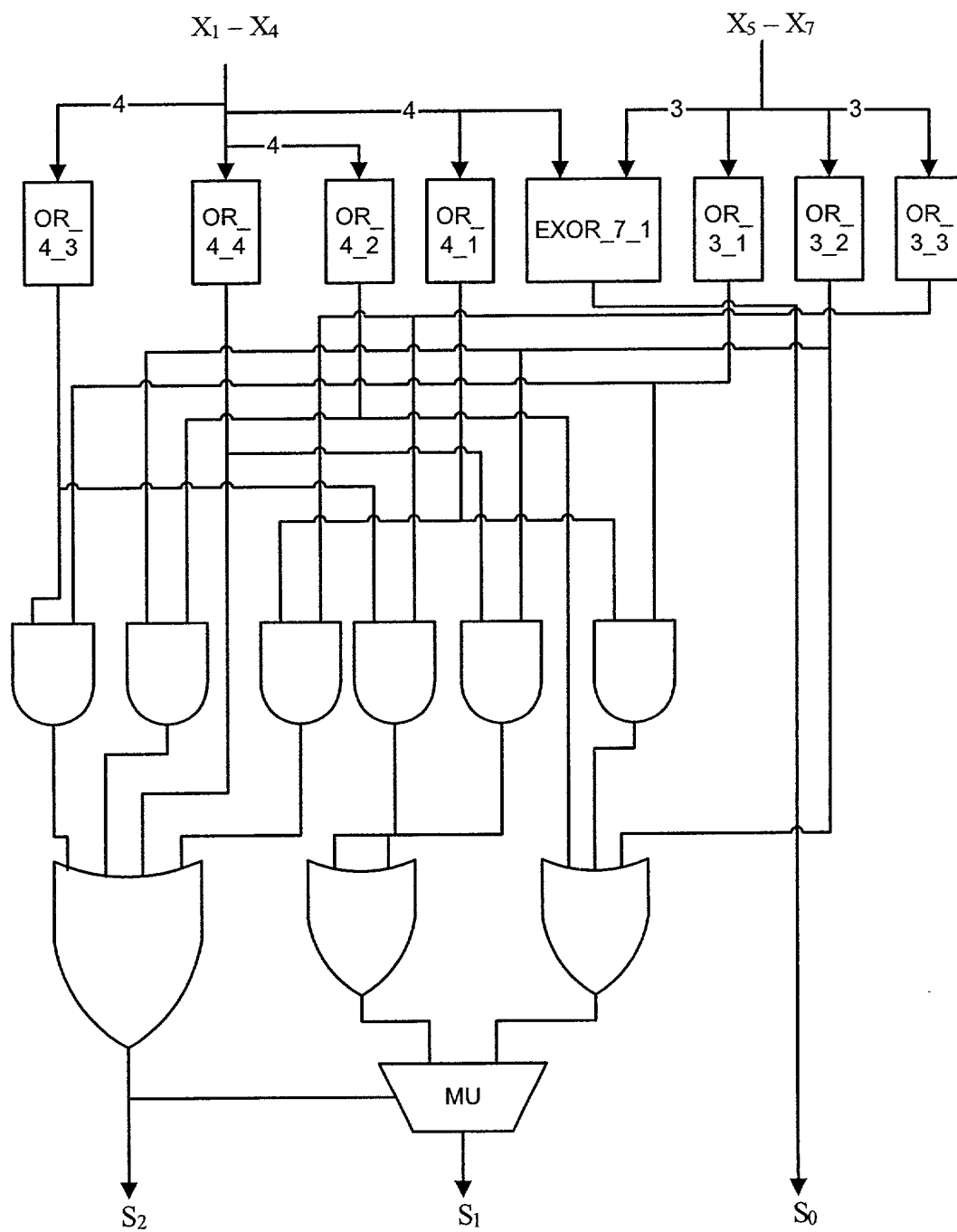
Fig 13
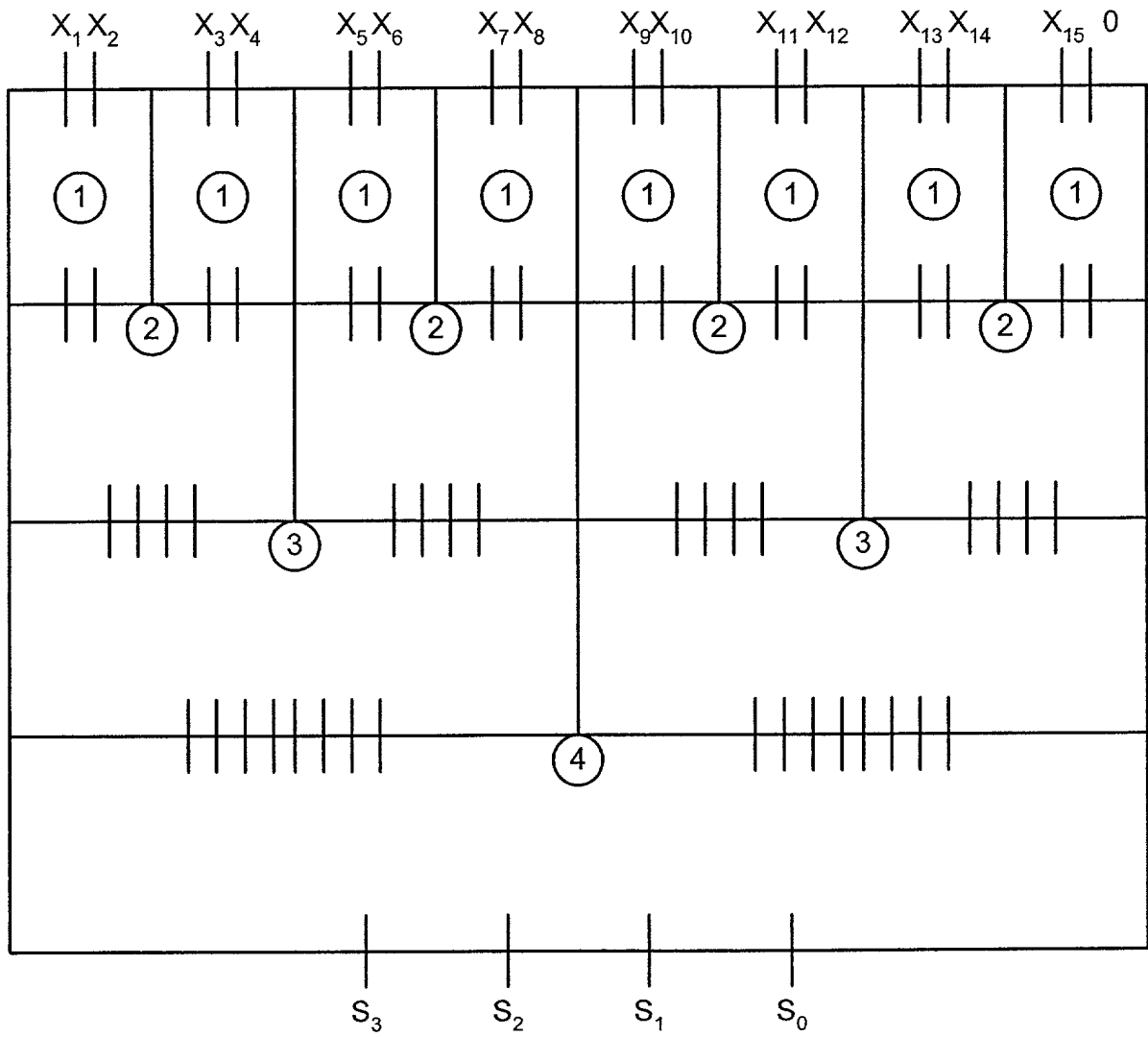
Fig 14
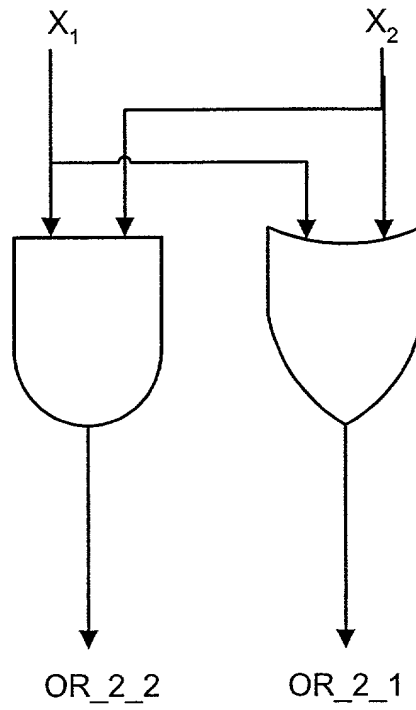
BLOCK 1

Fig 15

BLOCK 2
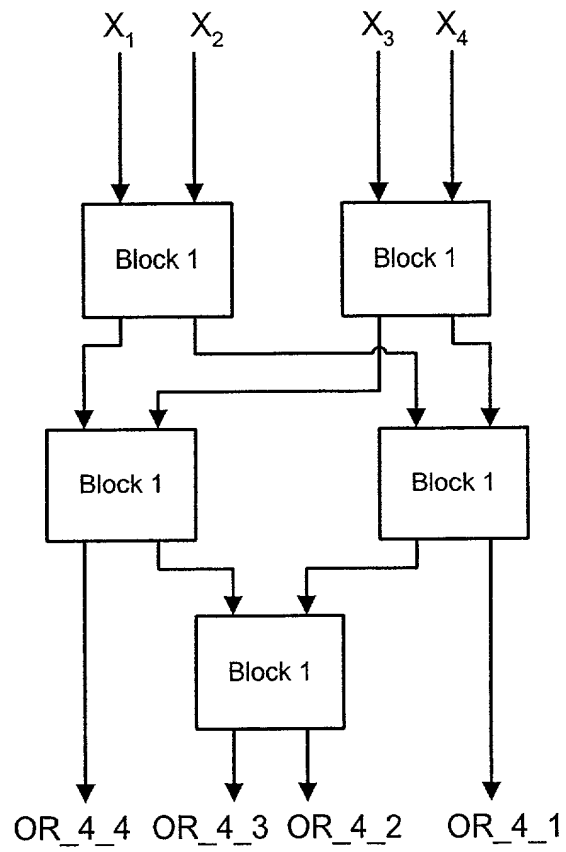
Fig 16

BLOCK 3
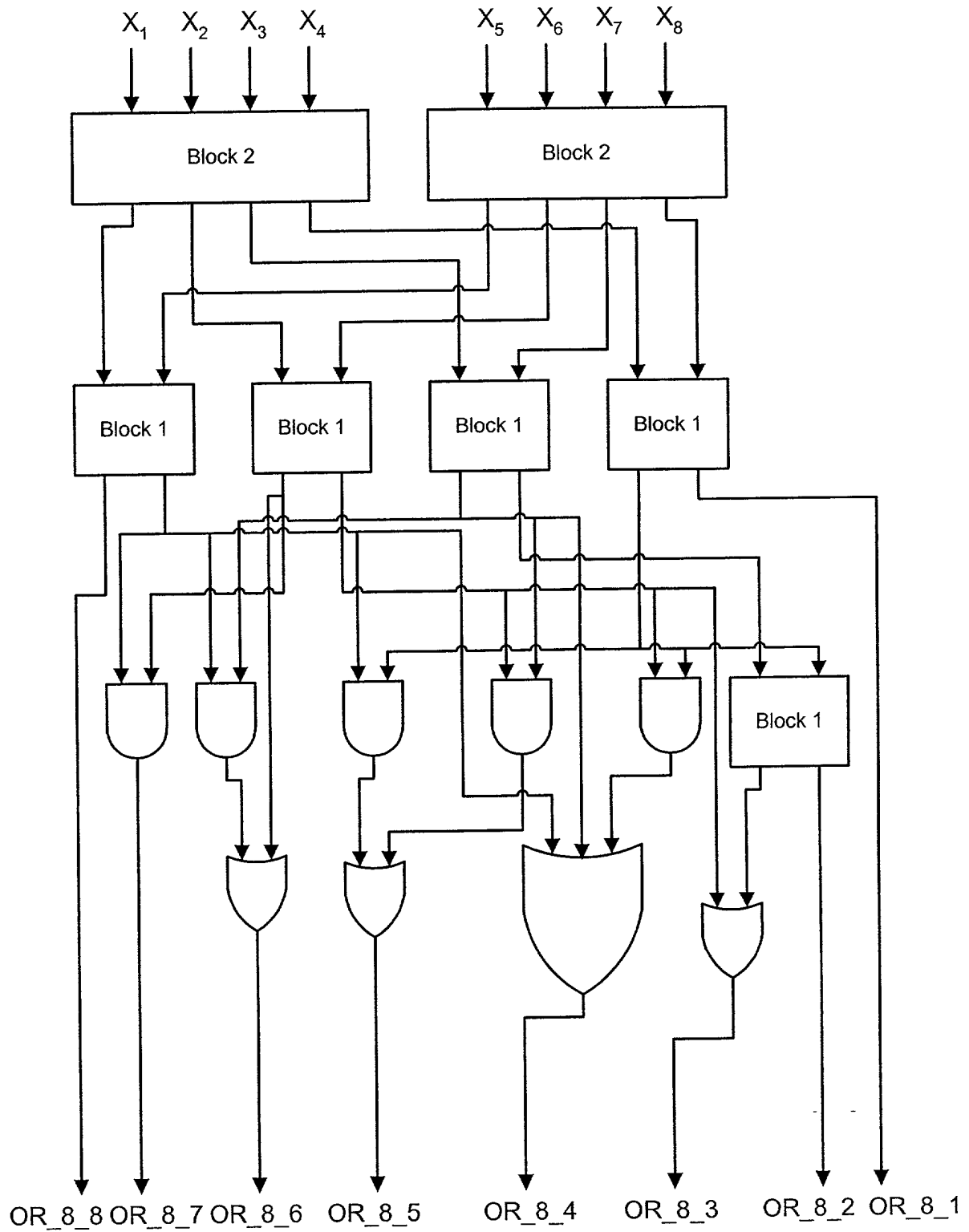
Fig 17

BLOCK 4
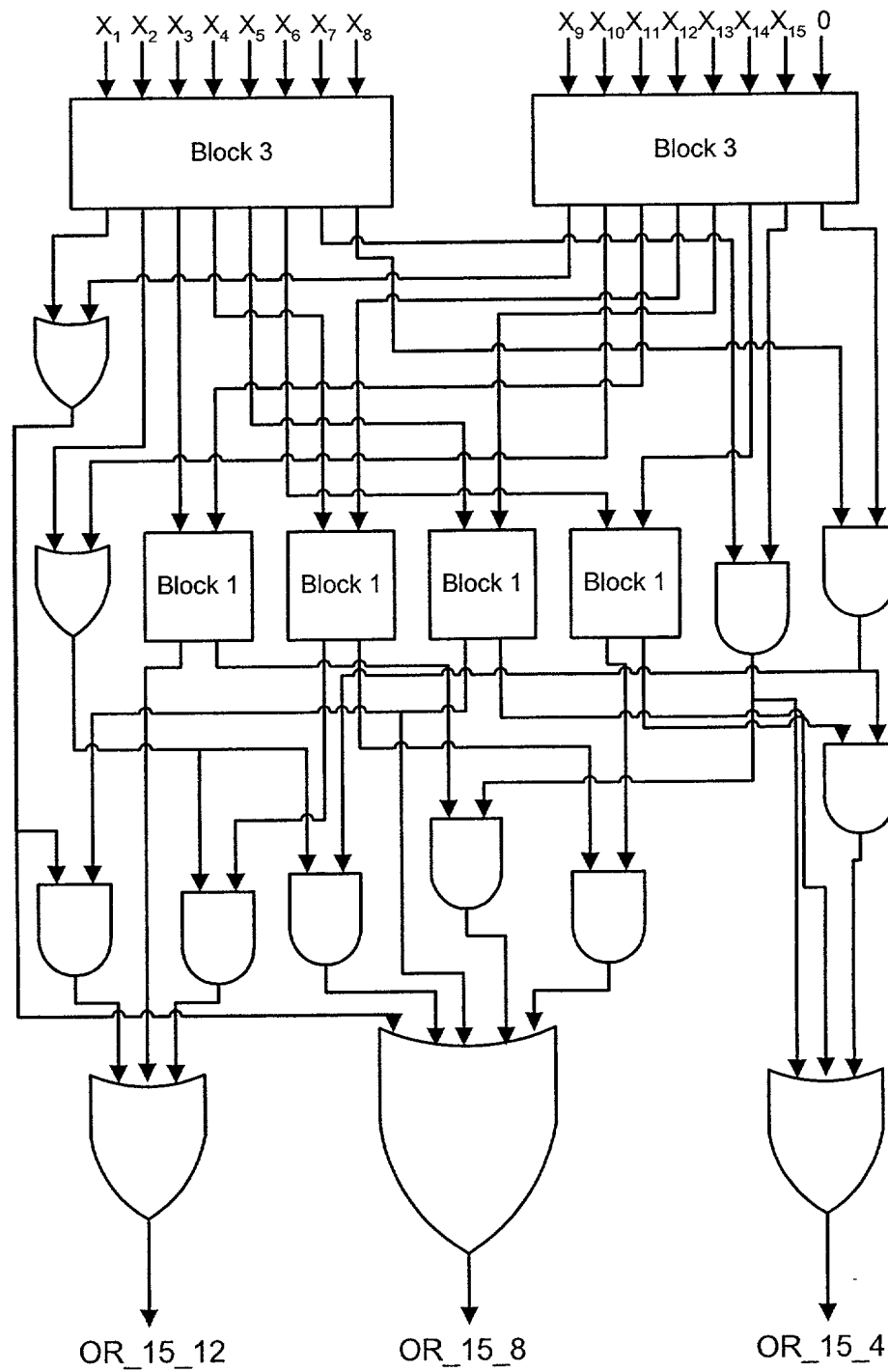
Fig 18

BLOCK 5
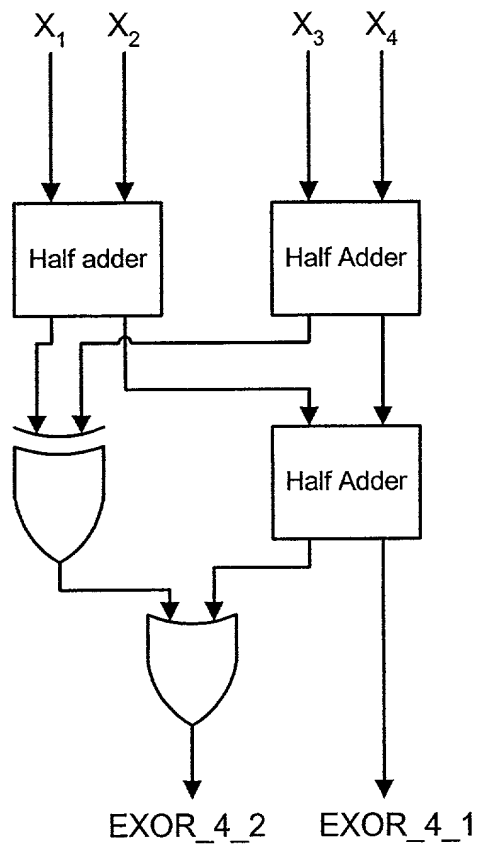
Fig 19

BLOCK 6

EXOR_15_2   EXOR_15_1

Fig 20

Fig 21

Fig 22

X_1-X_5 $X_6 X_7$

① 1   ① 1

② 2

S_2 S_1 S_0

Fig 23

X_1-X_4 X_5-X_7

① 1   ① 1

② 2

S_2 S_1 S_0

Fig 24

X1' X2' X3' X4' X5' X6' X7' X8'

① ① ① ①

② ②

③

[8,4]

Fig 25

A' B'

[2,1]

[2,2]

Fig 26

[2,1]a   [2,2]a   [2,1]b   [2,2]b

$[4,4] = [4,1]'$

$[4,3] = [4,2]'$

$[4,2] = [4,3]'$

$[4,1] = [4,4]'$

Fig 27

$[4,1]$a
$[4,4]$b

$[4,2]$a
$[4,3]$b

$[4,3]$a
$[4,2]$b

$[4,4]$a
$[4,1]$b

$[8,5]' = [8,4]$

Fig 28

PRIOR ART

$A_n - A_0$ $B_n - B_0$

Array Generation

Array Reduction

Addition of two numbers

$P_{2n+1} - P_0$
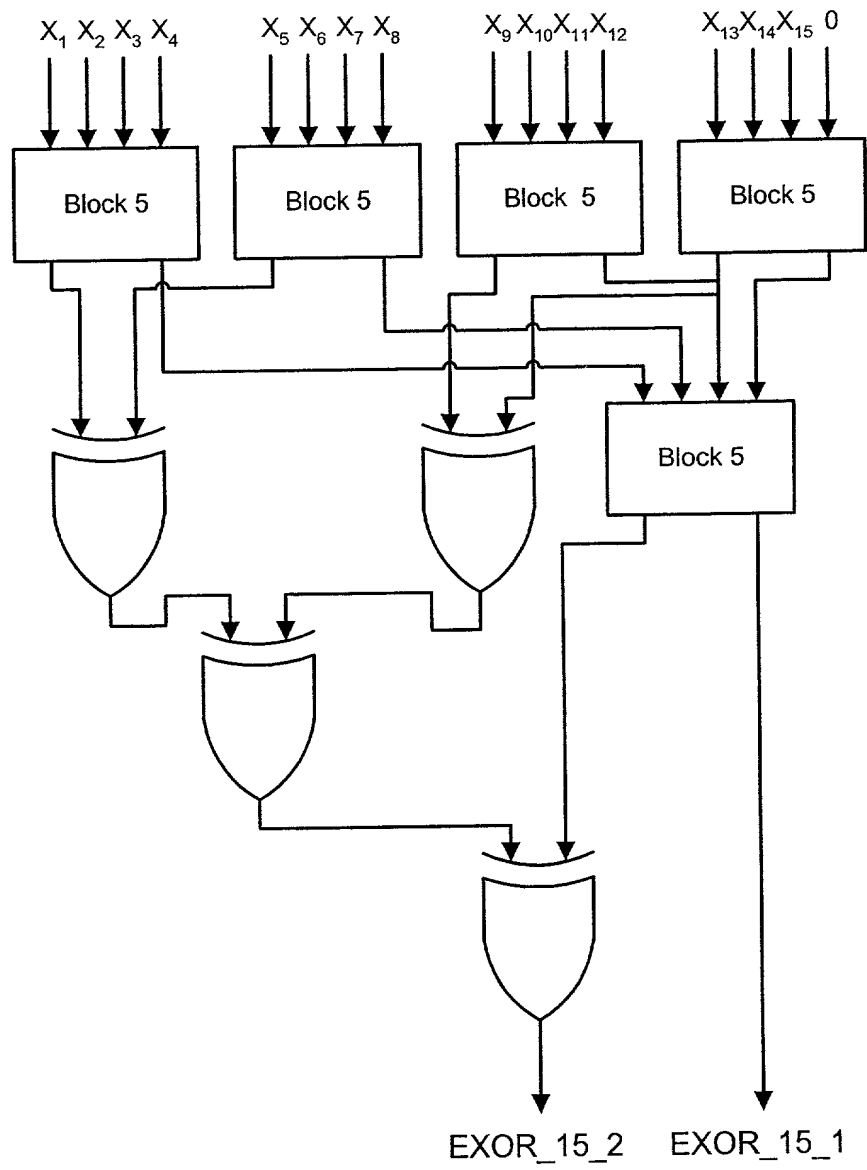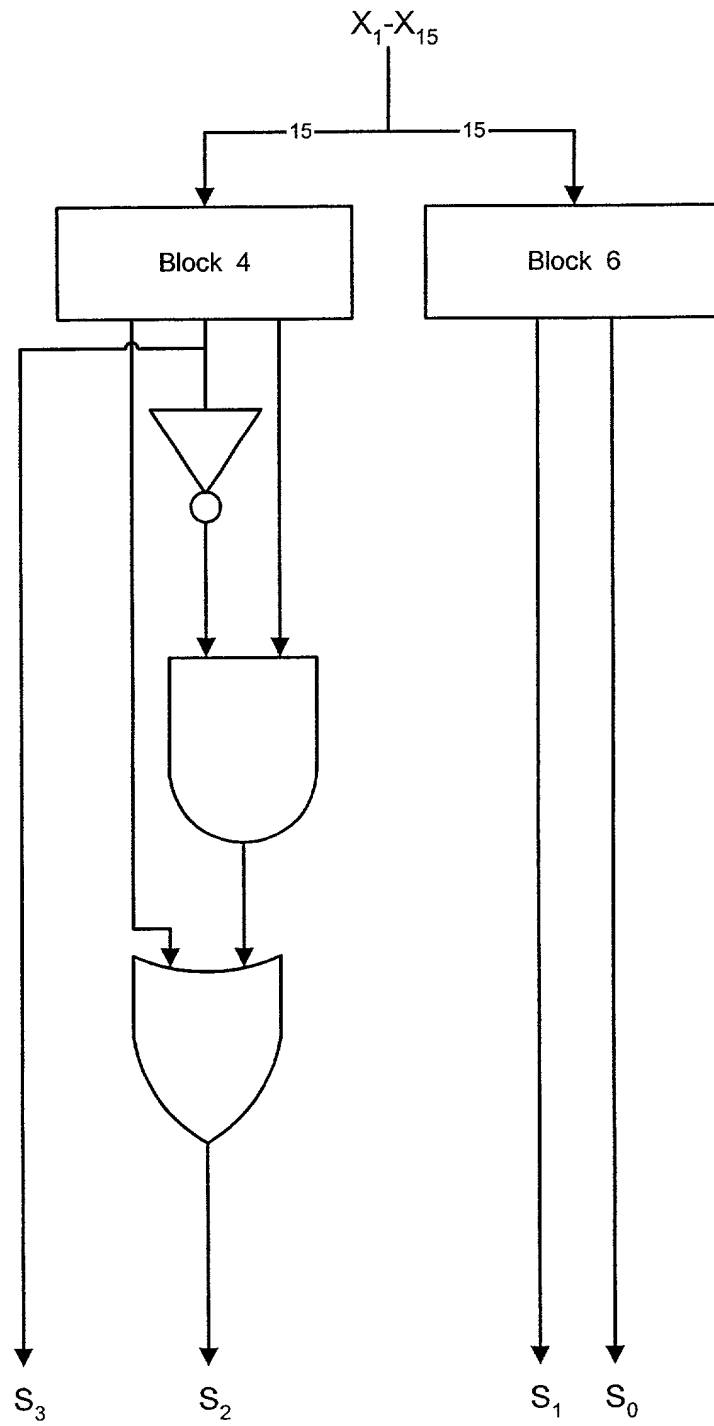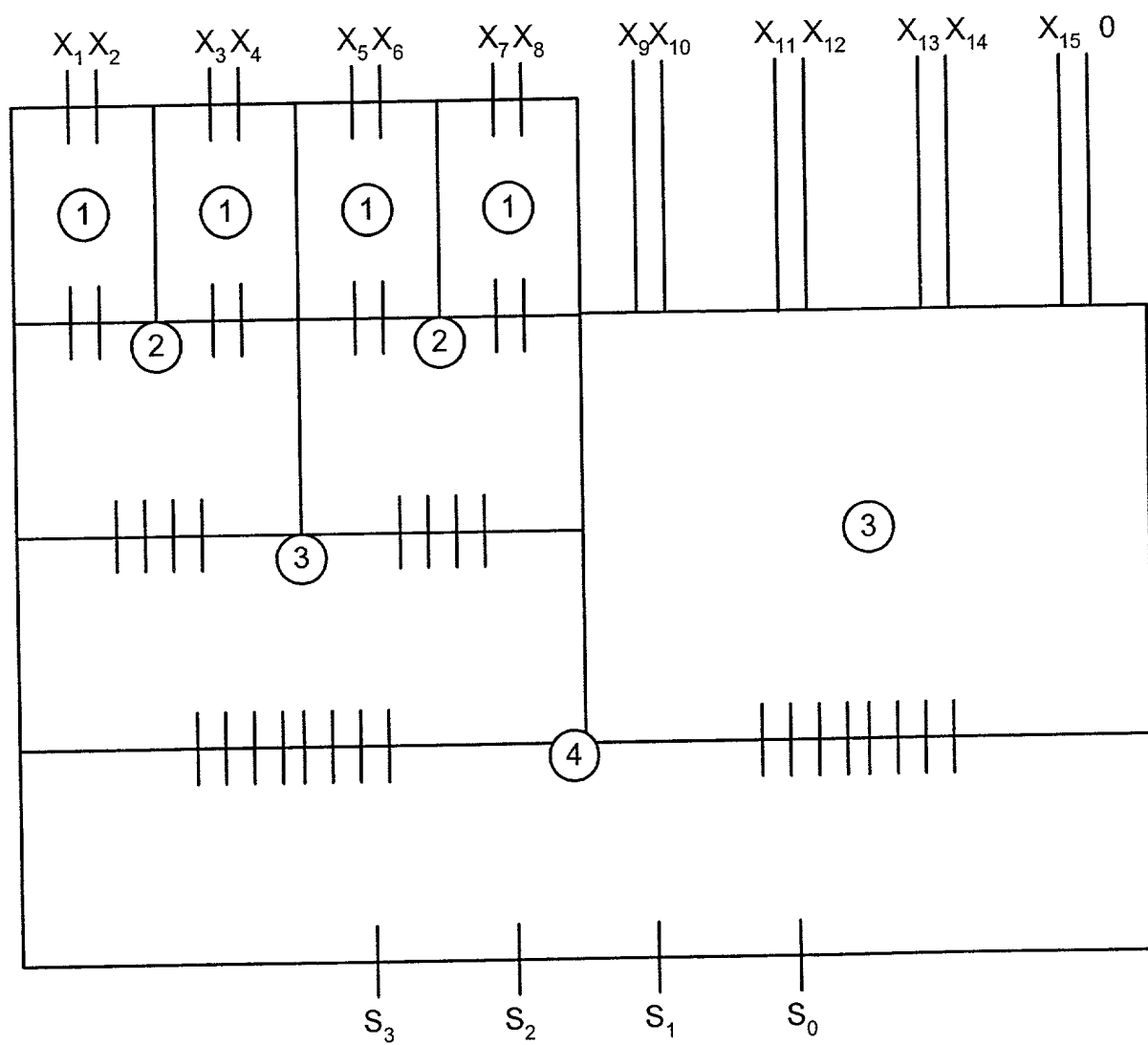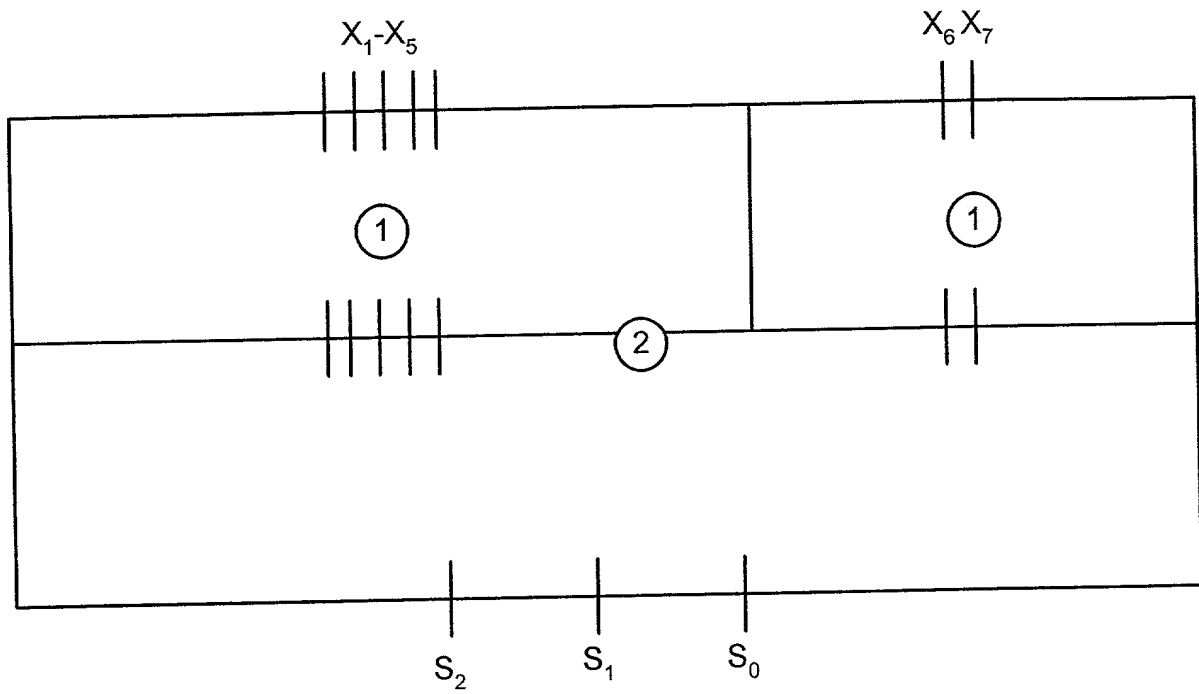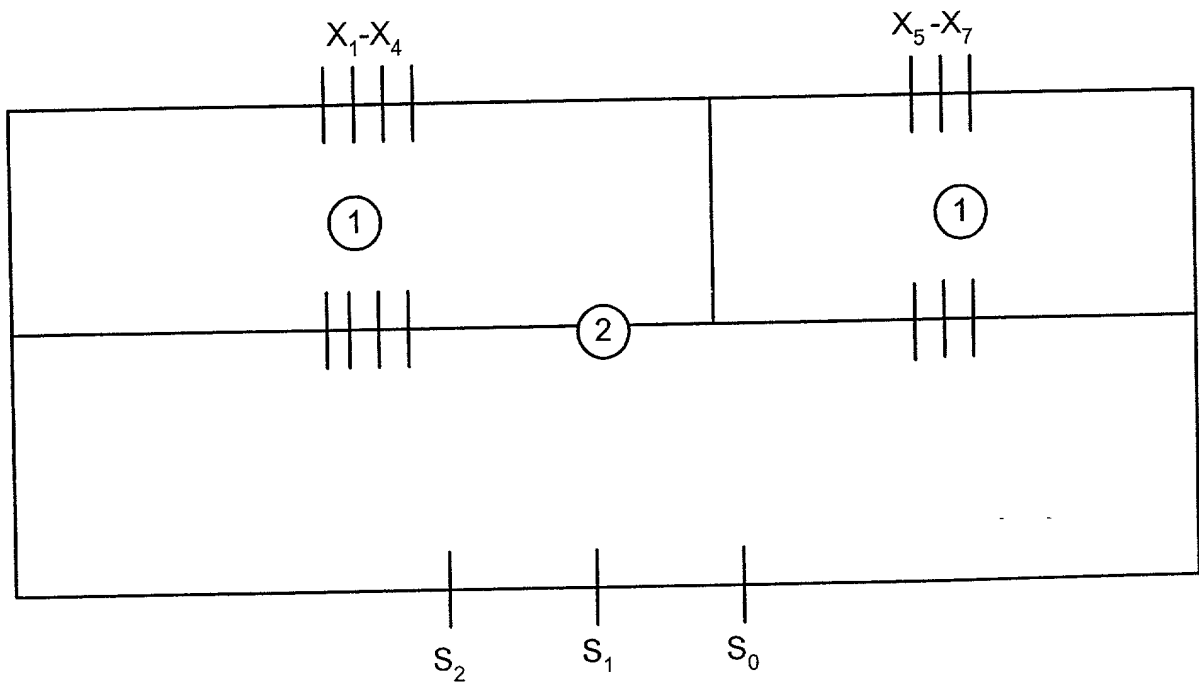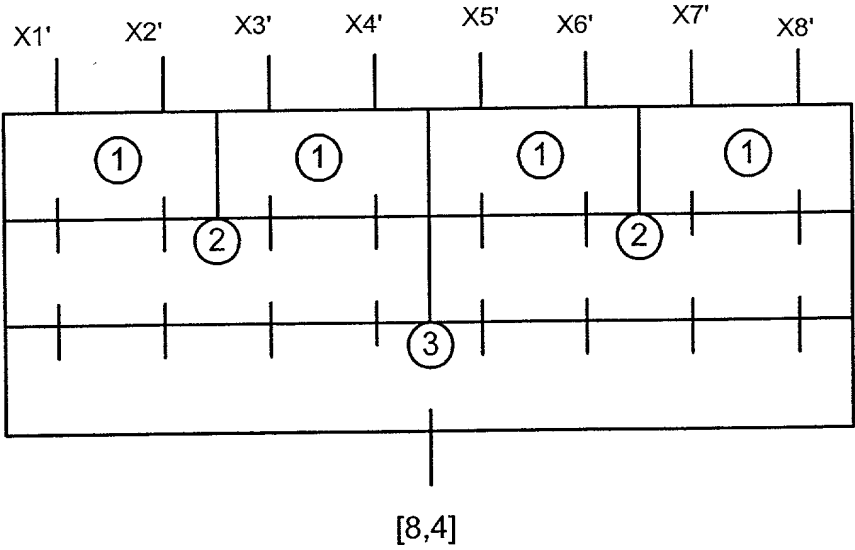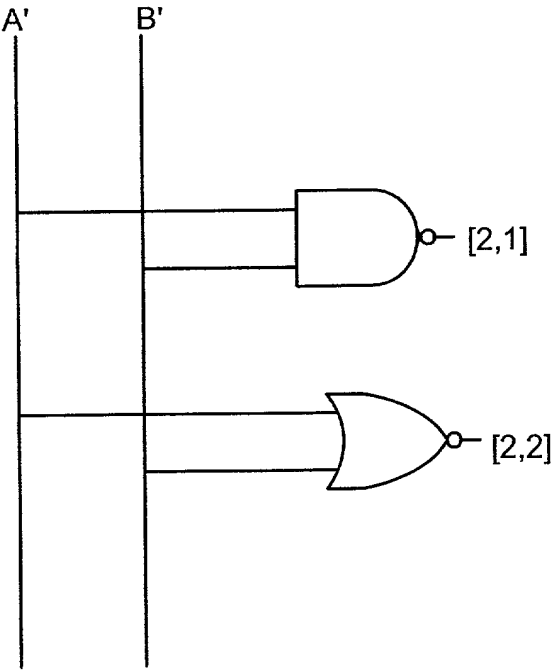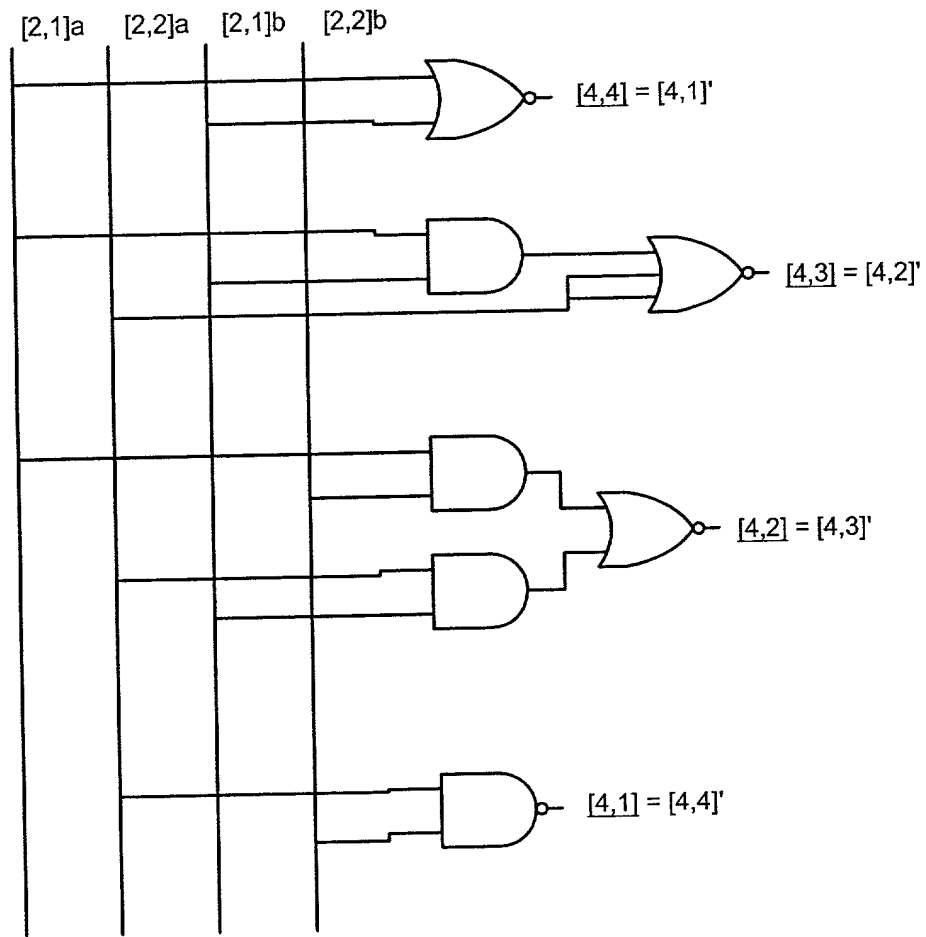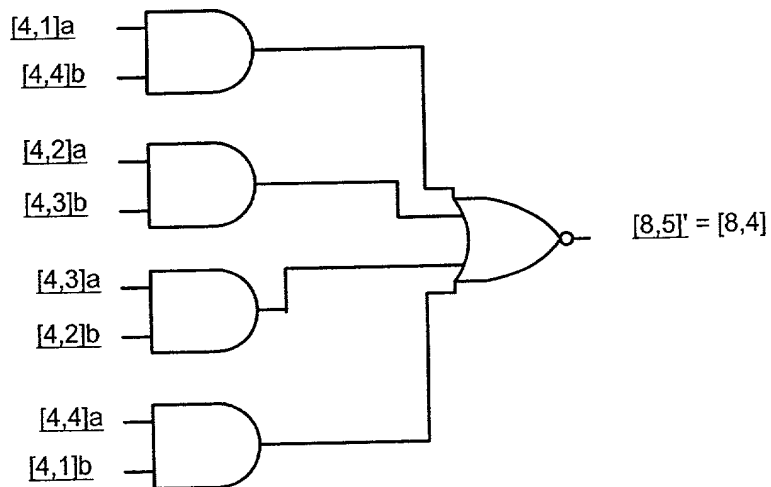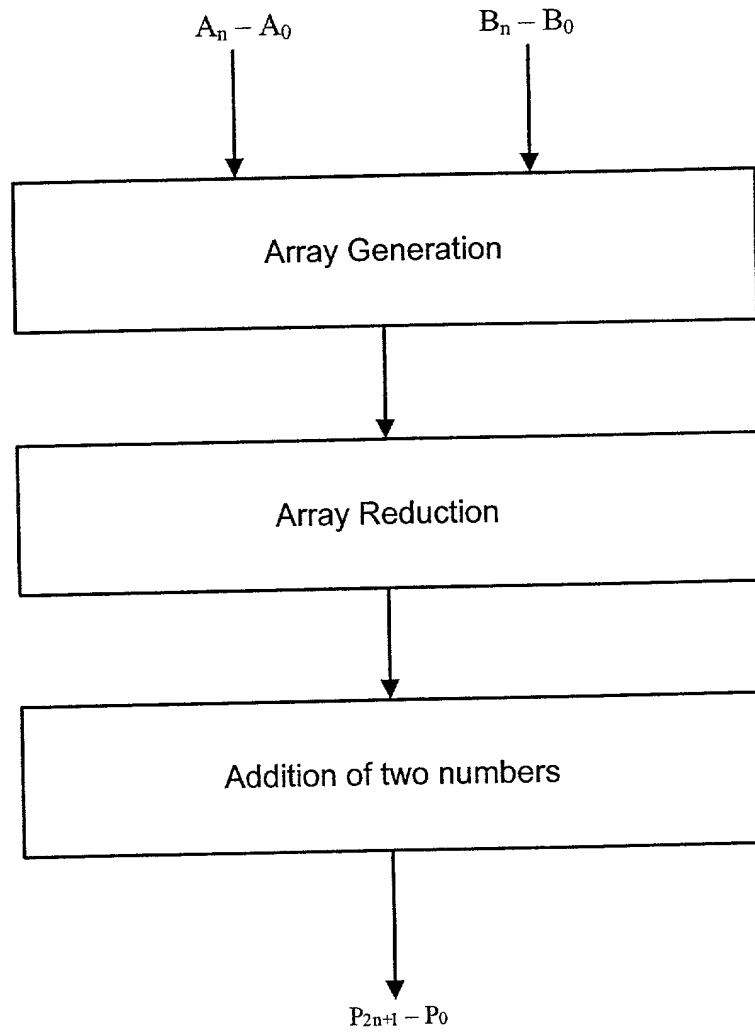
Fig 29

PRIOR ART

$$A_7B_0 \quad A_6B_0 \quad A_5B_0 \quad A_4B_0 \quad A_3B_0 \quad A_2B_0 \quad A_1B_0 \quad A_0B_0$$
$$A_7B_1 \quad A_6B_1 \quad A_5B_1 \quad A_4B_1 \quad A_3B_1 \quad A_2B_1 \quad A_1B_1 \quad A_0B_1$$
$$A_7B_2 \quad A_6B_2 \quad A_5B_2 \quad A_4B_2 \quad A_3B_2 \quad A_2B_2 \quad A_1B_2 \quad A_0B_2$$
$$A_7B_3 \quad A_6B_3 \quad A_5B_3 \quad A_4B_3 \quad A_3B_3 \quad A_2B_3 \quad A_1B_3 \quad A_0B_3$$
$$A_7B_4 \quad A_6B_4 \quad A_5B_4 \quad A_4B_4 \quad A_3B_4 \quad A_2B_4 \quad A_1B_4 \quad A_0B_4$$
$$A_7B_5 \quad A_6B_5 \quad A_5B_5 \quad A_4B_5 \quad A_3B_5 \quad A_2B_5 \quad A_1B_5 \quad A_0B_5$$
$$A_7B_6 \quad A_6B_6 \quad A_5B_6 \quad A_4B_6 \quad A_3B_6 \quad A_2B_6 \quad A_1B_6 \quad A_0B_6$$
$$A_7B_7 \quad A_6B_7 \quad A_5B_7 \quad A_4B_7 \quad A_3B_7 \quad A_2B_7 \quad A_1B_7 \quad A_0B_7$$

using 16 FA blocks

using 11 FA-s and 1 HA

using 7 FA-s

using 5 FA-s and 2 HA-s

Fig 30

A_1B_0 A_0B_0

A_2B_1 A_1B_1 A_0B_1

A_3B_2 A_2B_2 A_1B_2

A_4B_3 A_3B_3 A_2B_3

A_5B_4 A_4B_4 A_3B_4

A_6B_5 A_5B_5 A_4B_5

A_7B_6 A_6B_6 A_5B_6

A_7B_7 A_6B_7
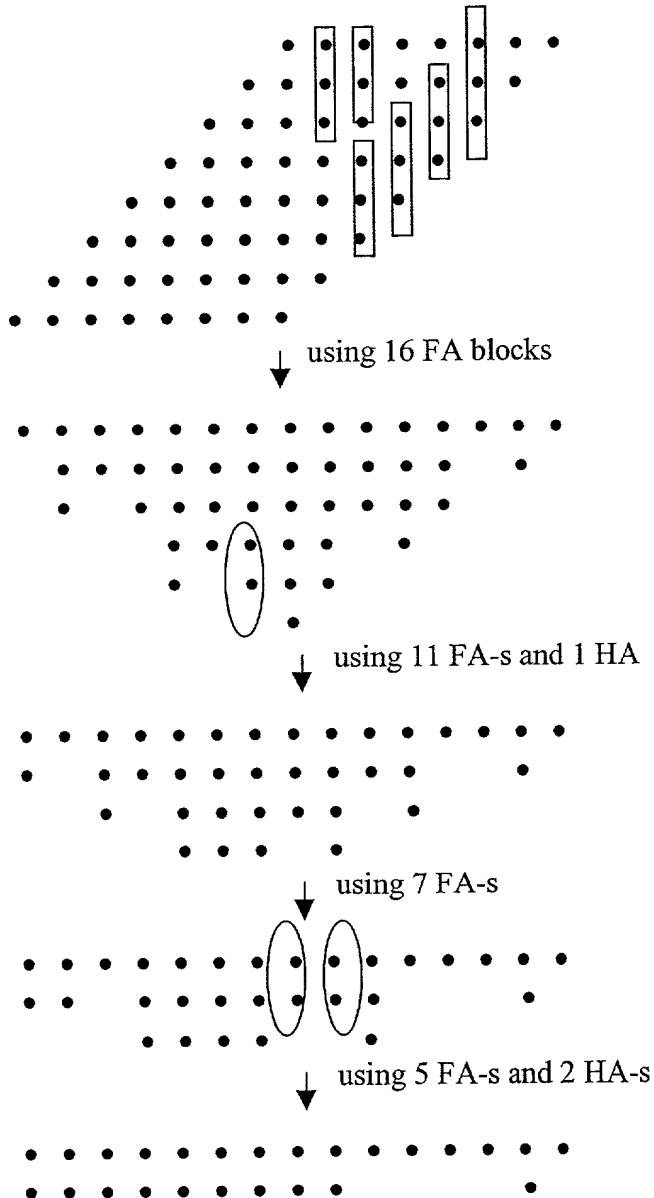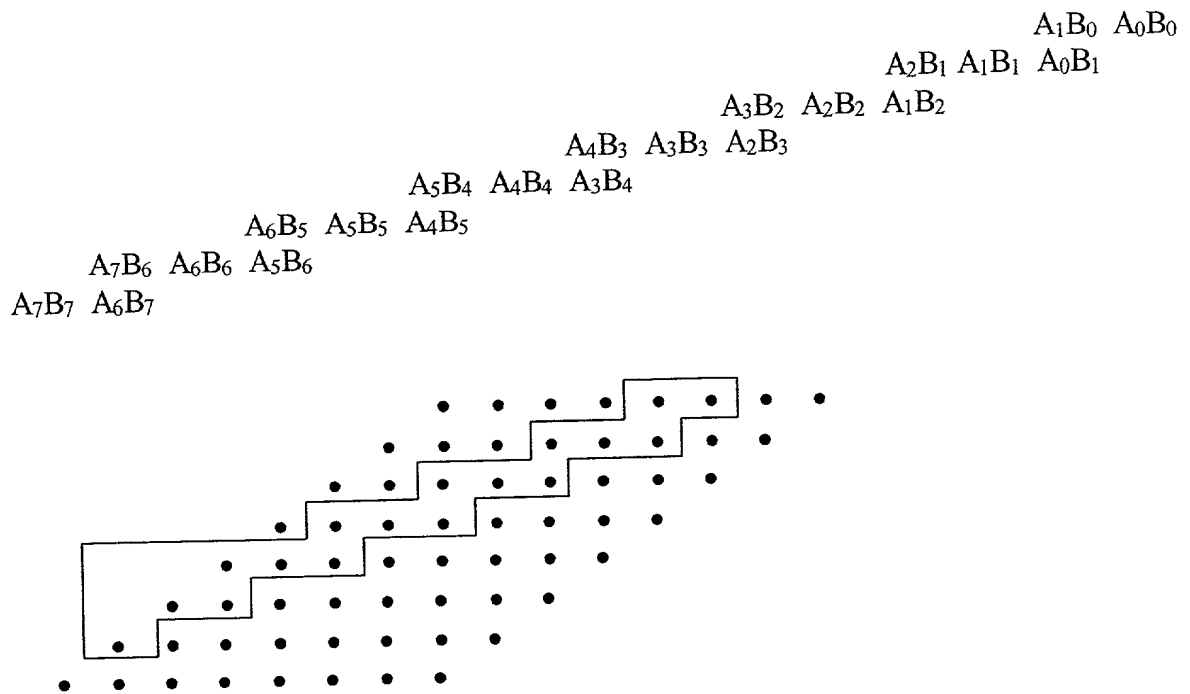
Fig 31

$$A_7B_0 \quad A_6B_0 \quad A_5B_0 \quad A_4B_0 \quad A_3B_0 \quad A_2B_0 \quad A_1B_0 \quad A_0B_0$$
$$Z \quad A_7B_1 \quad A_6B_1 \quad A_5B_1 \quad A_4B_1 \quad A_3B_1 \quad A_2B_1 \quad A_1B_1 \quad A_0B_1$$
$$A_7B_2 \quad A_6B_2 \quad A_5B_2 \quad A_4B_2 \quad A_3B_2 \quad A_2B_2 \quad A_1B_2 \quad A_0B_2$$
$$A_7B_3 \quad A_6B_3 \quad A_5B_3 \quad A_4B_3 \quad A_3B_3 \quad A_2B_3 \quad A_1B_3 \quad A_0B_3$$
$$A_7B_4 \quad A_6B_4 \quad A_5B_4 \quad A_4B_4 \quad A_3B_4 \quad A_2B_4 \quad A_1B_4 \quad A_0B_4$$
$$A_7B_5 \quad A_6B_5 \quad A_5B_5 \quad A_4B_5 \quad A_3B_5 \quad A_2B_5 \quad A_1B_5 \quad A_0B_5$$
$$A_7B_6 \quad A_6B_6 \quad A_5B_6 \quad A_4B_6 \quad A_3B_6 \quad A_2B_6 \quad X \quad A_0B_6$$
$$A_7B_7 \quad A_6B_7 \quad A_5B_7 \quad A_4B_7 \quad A_3B_7 \quad A_2B_7 \quad Y$$

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0   - column numbers
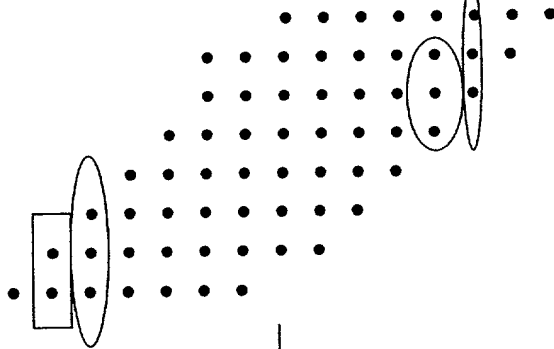
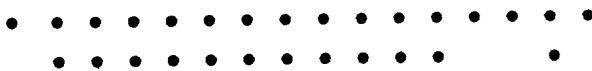using 1 HA, 3 FA-s, and 8 higher parallel counters
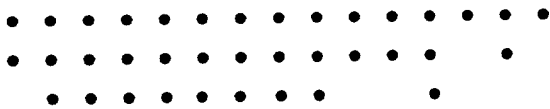
using 9 FA-s and 3 HA-s
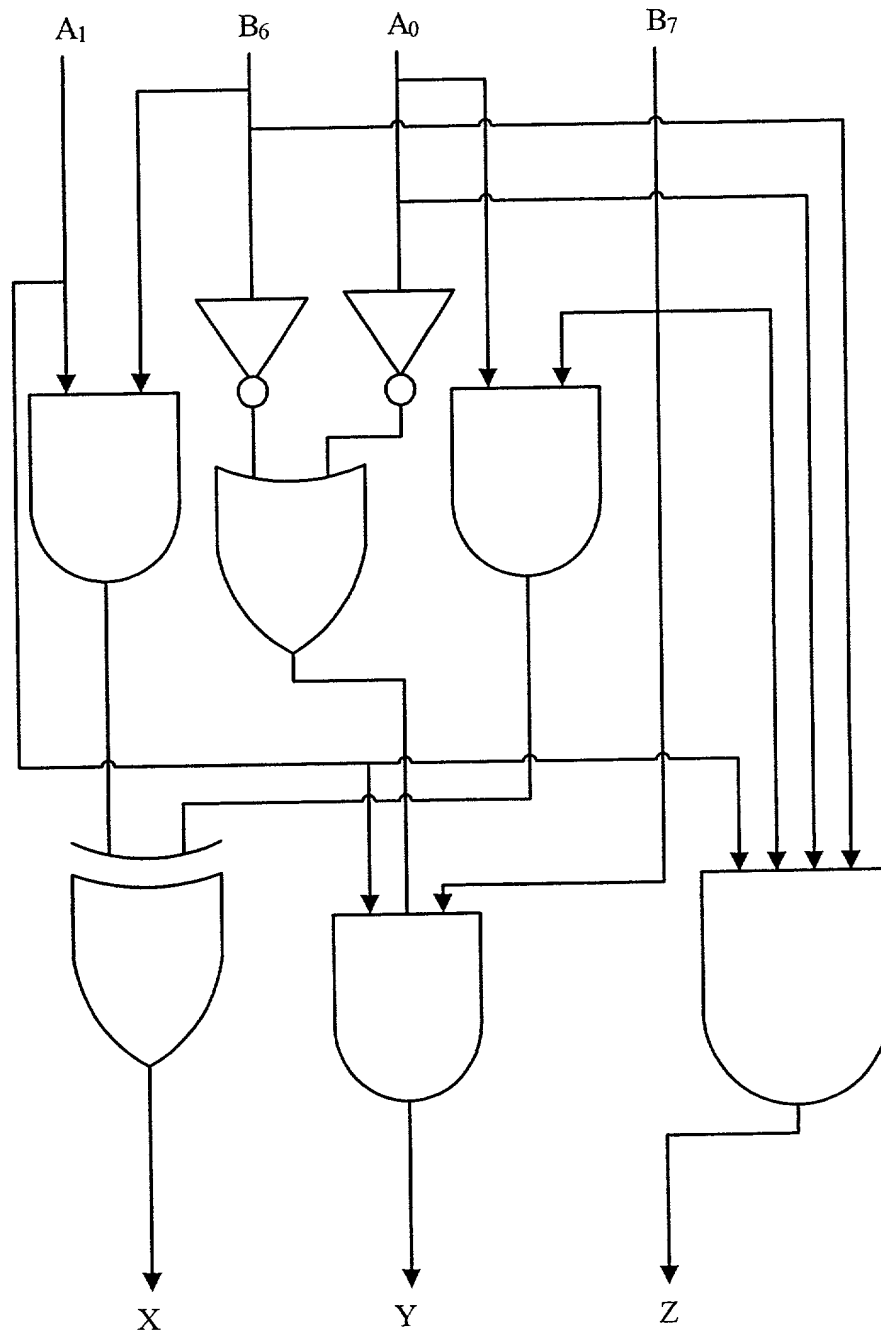
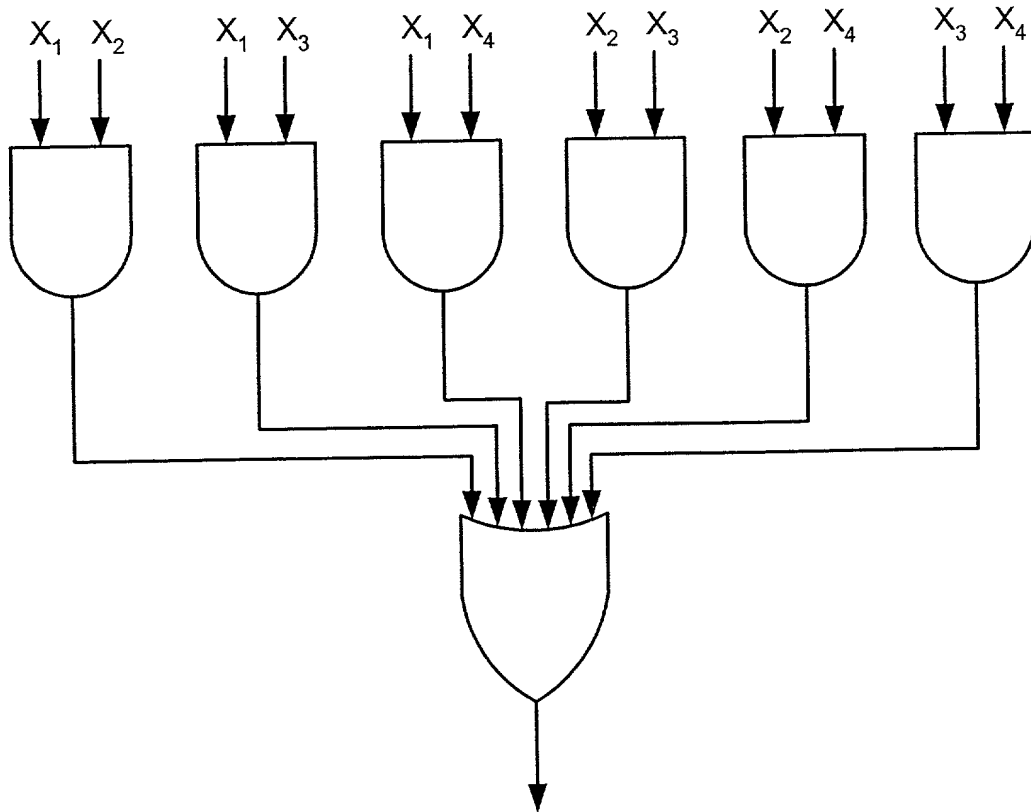Fig 32

Fig 33

Fig 34